

What is claimed is:

1. A process for preparing a) nitriles of the formula (II) and b) isonitriles of the formula (III)



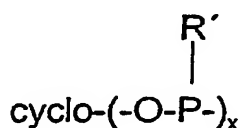
by reacting

a) carboxamides (RCO-NH_2), ammonium salts of carboxylic acids (RCOO-NH_4^+) or carboxylic acids in the presence of ammonia or ammonium salts ($\text{RCOOH} + \text{NH}_3$, $\text{RCOOH} + \text{NH}_4^+$) or

b) formamides (H-CO-NHR) or mixtures of amines with formic acid, with cyclic phosphonic anhydrides with elimination of water at a temperature in the range from -30 to $+120^\circ\text{C}$,

where R may have any substitution and is a linear or branched C_1 - C_8 -alkyl radical, a C_3 - C_{10} -cycloalkyl, alkenyl, alkynyl or an aryl or heteroaryl radical.

2. The process as claimed in claim 1, wherein the cyclic phosphonic anhydride is a 2,4,6-substituted 1,3,5,2,4,6-trioxatriphosphinane 2,4,6-trioxide of the formula (I)



where $x = 3, 4$ or 5 and

R' are each independently open-chain or branched, saturated or unsaturated, straight-chain C_1 to C_{16} -alkyl radicals or cyclic C_3 to C_{16} -alkyl radicals, or aryl or heteroaryl.

3. The process as claimed in claim 2, wherein R' is a methyl, ethyl, n-propyl, isopropyl, n-butyl, 2-butyl, isobutyl, pentyl, hexyl, in particular an ethyl, propyl, and/or butyl radical.

4. The process as claimed in claim 2, wherein the cyclic phosphonic anhydride is propanephosphonic anhydride.
5. The process as claimed in at least one of the preceding claims, wherein the cyclic phosphonic anhydride is added to the amide- or formamide-containing reaction solution either as a melt or dissolved in a solvent.
- 10 6. The process as claimed in claim 5, wherein the cyclic phosphonic anhydride is added in an aprotic solvent, preferably in a ratio of from 1:1 to 1:2.
- 15 7. The process as claimed in at least one of the preceding claims, wherein the reaction solution is heated to the reaction temperature after addition of the phosphonic anhydride.
- 20 8. The process as claimed in at least one of the preceding claims, wherein, in the case of preparation of nitriles, an ammonium salt together with a carboxylic acid (R-COOH) is reacted with the phosphonic anhydride in the presence of a base.
9. The process as claimed in claim 8, wherein the base used is triethylamine, tripropylamine, benzyldimethylamine, N,N-dimethylaniline or pyridine.